UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VII
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

7 MAR 2002

MEMORANDUM

SUBJECT: Risk Based Remedial Goals
AK Steel
Kansas City, Missouri

FROM: Jeremy Johnson JJ
Immediate Office
Air, RCRA and Toxics Division

TO: Stephanie Doolan, Project Manager
RCRA Corrective Action and Permits Branch

As requested, I have reviewed the Corrective Action Objectives as part of the CMS Work Plan for SWMUs 2, 3, 5, 7, 17, 33 and AOC 8 for AK Steel, Kansas City, Missouri. Below I have provided general and specific comments on the document. Please contact me at extension 7510 if you have any questions or need clarification on the comments.

General Comments

1. Using the default SSLs provided by USEPA as screening levels in the risk assessment does not ensure adequate protection against the potential additive health effects associated with noncarcinogenic chemicals at the site. As stated in the SSL Guidance "the potential for additive effects [due to noncarcinogenic chemicals] has not be "built in" to the SSLs through apportionment." Several non-carcinogenic chemicals that were detected at or immediately below their respective SSLs were screened out of the development of corrective action objectives (CAOs). It is recommended that soil screening levels for non-carcinogenic effects be calculated by dividing USEPA Region 9 Preliminary Remediation Goals (PRGs) by a value of 10.

2. The CAOs for soil are often several orders of magnitude higher than USEPA migration to groundwater protection levels.

3. The development of a CAO for lead in the CMS Work Plan is based upon three exposure scenarios which are the pregnant full-time worker, generic full-time worker, and construction worker. In fact, the work plan establishes a lead clean up level that is based

upon the construction worker scenario with a blood lead goal of 20 µg/dL. Calculation of a lead clean up level for workers other than women of child bearing age with a blood lead goal of 20 µg/dL is not relevant or appropriate. In accordance with TRW guidance, all exposure scenarios should account for a woman of child-bearing age with a target fetal blood lead level of 10 µg/dL.

4. While the CMS Work Plan utilizes the TRW adult blood lead model and most of the standard default parameters to calculate lead clean-up levels, the daily soil intake rate used, 10 mg/day, is significantly lower than the default value. Consequently, the lead clean-up value was calculated to be more than 8,000 mg/kg for construction workers and 32,000 mg/kg for full time workers. Typical clean-up levels range from 400 - 2000 mg/kg lead depending on exposure pathways. See specific comment 7.

5. In section 2.3 it is stated that CAOs were calculated assuming that a future worker could be simultaneously exposed to all chemicals of potential concern at the facility. However, two sets of CAOs were developed for areas containing multiple chemicals and areas with a single chemical (See General Comment 6). If the CAOs are meant to include exposures to all chemicals at the facility then their respective levels should be calculated accordingly.

   It is also important to account for the fact that a worker could come into contact with the same substances through several pathways (RAGS Part A, 1989). For example a construction worker could come into contact with contaminated groundwater and soil at the same area. Such a combination could cause an exceedance of the cumulative lifetime target risk and hazard index if CAOs for individual chemicals are set at levels corresponding to 1E-5 or 1E-4 excess lifetime cancer risk and 1 or 0.3 hazard index.

6. CAOs were developed for a multiple chemical exposure and single chemical exposure. The multiple chemical exposure scenario established CAOs for each chemical at target cancer risk of 1E-5 and a hazard index of 0.3. The single chemical exposure had a target cancer risk of 1E-4 and a hazard index of 1. First, it should be noted that the Section 300.430(e)(i)(A)(2) of the National Contingency Plan (NCP) states a risk level of 1E-6 should be used as the point of departure for determining remediation goals in areas with multiple contaminants or multiple exposure pathways. In addition, the CMS Work Plan should provide a basis for the hazard indices used to develop the CAOs. Non-cancer CAOs should be established based on similar target organs. Given this information and information provided in general comment 5 and that there are more than 18 chemicals of concern at the facility (not including the noncarcinogenic chemicals that were screened out), the cumulative excess lifetime cancer risk and total hazard index could exceed a 1E-4 and 1, respectively.

7. Groundwater CAOs are well above the Maximum Contaminant Levels (MCLs). Although it is stated that the groundwater at the facility is not being used as a drinking water source, it is EPA policy to consider the beneficial use of the water and to protect against current and future exposures, as stated in the NCP.

Specific Comments

1. **Section 3.1, Page 3-2 Paragraph 2.** The last paragraph states 5% gastrointestinal absorption efficiency factor was used to extrapolate the dermal RfD from the oral RfD for Cadmium. A value of 2.5% gastrointestinal absorption efficiency factor should be used as cited in "Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim Guidance" (USEPA 2001a) (RAGS Part E).

2. **Section 4.4.1.1, Page 4-6 Paragraph 2.** In this paragraph a soil adherence factor was generated for the full-time worker. The adherence factor was based on the "Groundskeepers No. 1" scenario. No reason was provided in the document why this specific scenario was chosen over other possible full-time worker scenarios. Given the variability in possible activities the full-time worker would be engaged in at the facility, the default soil adherence factor of 0.2 mg/cm^2 should be used. This value, as stated in the "Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites - Draft Final"(August 2001) and RAGS Part E, represents the median (50^{th} percentile) value for all adult workers at commercial and industrial sites.

3. **Section 4.4.1.1, Page 4-7 Paragraphs 1 and 2.** These paragraphs state that an incidental soil ingestion rate of 50 mg/day was used to estimate intake for full-time workers and that the workers were to spend 100 percent of their time outdoors. If the workers are assumed to spend 100% of their time outdoors, then a soil ingestion rate of 100 mg/day should be used as recommended by EPA's Technical Review Workgroup for Lead (TRW) and the "Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites - Final Draft"(August 2001).

4. **Section 4.4.1.2, page 4-7 Paragraph 2.** This paragraph states that a soil adherence factor of 0.22 mg/cm^2 is used for a construction worker. A value of 0.3 mg/cm^2 should be used as recommended in "Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites - Final Draft"(August 2001) and RAGS Part E.

5. **Section 4.4.2.3, Page 4-9.** This section discusses the use of a gastrointestinal adjustment factor (AAF) in assessing exposures to chemicals in soil via incidental ingestion. The text indicates that the dose estimate associated with incidental ingestion of PAHs in soil was adjusted by a factor of 0.29, base on data provided in Magee et al, 1996. The application of an AAF in estimating the intake of PAHs in soils does not provide a conservative evaluation of potential risks associated with the ingestion of chemicals in soil and is not consistent with RAGS Part E, which recommends a 100% AAF The text and associated table should be modified to eliminate the use of the AAF.

6. **Section 4.4.2.4, Page 4-9, Paragraph 2.** A value of 0.014 was used for dermal absorption for all PAHs. This absorption factor does not represent an adequately conservative value for use in this document. In accordance with "Supplemental Guidance

for Developing Soil Screening Levels for Superfund Sites" and RAGS Part E, a value of 0.13 should be used for dermal absorption of PAHs.

Chemical specific absorption values for other compounds are also available in these documents and should be used if necessary.

7. **Section 5.2, Page 5-3, Paragraph 1 and 2.** Under the subsection headed "Mean Daily Intake of Soil" it is stated that an ingestion rate of 10 mg/day was used for the pregnant worker and full-time outdoor worker scenarios. Given the unique methodology of adult lead risk assessment, this value or any other independently derived values for soil ingestion should not be used. Instead, the TRW recommended that a value of 50 mg/day should be used. This value represents daily soil ingestion from all occupational sources, including soil indoor dust as stated in the "Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil"(December 1996), TRW Fact Sheet (April 1999), and Exposures Factors Handbook (1997). These paragraphs should be deleted or discussed in the uncertainty section of the document.

   In addition, the last paragraph of this sub-section provides the soil ingestion rate of 50 mg/day for a construction worker. A value of 100 mg/day should be used as recommended by the TRW(April 1999).

8. **Section 5.2, Page 5-3.** In the subsection "Exposure Frequency and Duration," the exposure frequency for pregnant and full-time workers is 250 days/year. As recommended by the TRW, a default value of 219 days/year should be used for lead risk assessment purposes.

9. **Table 5-1 and Table 5-2.** These tables present the blood lead concentration calculations including the equations and variable values. Although the text does not mention it, the calculations include the variable fraction soil ingested from the site (FS), which is given a value of 0.5 and is multiplied against the soil and dust ingestion rate. The use of this variable is not part of the adult blood level model nor is it recommended and is not supported by any site-specific information. Therefore, the FS variable should be 1.0 or not be used at all and the tables should be corrected